Mr. Don W. Miller, President
Miller Pipeline Corporation
210 South Broadway
Green Springs, OH 44836

Dear Mr. Miller:

Thank you for your letter of July 8, 1974, asking whether the "Avonseal" process may be used to meet the requirement of 49 CFR 192.753(a). This rule reads as follows:

> "Each cast iron caulked bell and spigot joint that is subject to pressures of 25 p.s.i.g. or more must be sealed with mechanical leak clamps."

Based on our review of the supportive material which you provided, we have concluded that the "Avonseal" process would not meet the requirement of §192.753(a). This process does not produce a seal by the use of "mechanical leak clamps" as the standard requires. The seal produced is primarily due to chemical bonding rather than to mechanical application of forces by a "clamp" in the ordinary sense of the word.

We believe, however, that the effect of the "Avonseal" process in sealing caulked bell and spigot joints may be the same or better than "mechanical leak clamps." Therefore, we are considering your letter as a petition for rule making to amend §192.753(a) to permit the use of the "Avonseal" and similar sealing processes. A notice of proposed rule making will be issued and published in the Federal Register to invite public comment on the proposed rule change.

Your letter and supportive material are included in Docket No. Pet. 74-11. Please refer to this number in any future communication on the matter.

We appreciate your interest in pipeline safety.

Sincerely,

Joseph C. Caldwell
Director
Office of Pipeline Safety

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Mr. Joseph Caldwell
Director
Office of Pipeline Safety
Department of Transportation
Washington, D.C. 20590

Dear Mr. Caldwell:

Enclosed is literature and technical data describing a leaksealing process presently being marketed in the United States under the trade name "Avonseal".

We request that your department consider an interpretation accepting this method of leak clamping as meeting the requirements of paragraph 192.753(a) of the OPS Rules.

We are submitting under separate cover a cutaway cross section of a bell and spigot joint that has been clamped with this method. By cutting the section out from the rest of the bell we have negated the holding power of the lead and the two pieces of metal are being held together only by the rubber seal. As you can see, (and has been proven by many tests, Re: technical data 1971) this material is quite strong.

Not only does this method of clamping compliment the already considerable strength of a lead joint, but the method of installation refrains from pulling the joint such as regular metal leak clamps are inclined to do. In addition to having considerable strength, the joint remains flexible. So, like an airplane wing, it will yield slightly when subjected to severe force but yet remain intact, still doing its job. While remaining intact, keeping the leak in check, it has done nothing to make the joint rigid which could increase the likelihood of pipe breakage. Besides the above mentioned features, there is nothing in the seal to corrode and it does the job it is there for. It <u>stops the leak permanently.</u>

The above described process is not to be confused with various encapsulation and sealing methods which have little or no bond to the metal. With Avonseal the strength of the bond is greater than that of the material. Supporting data is provided in "Technical Data 1971."

A complete description of the Avonseal process is as follows. This method of repair is based on the principle of bonding rubber to metal by using a priming system to effect a mechanical and chemical key between the cast iron and polychloroprene rubber.

The joint to be sealed is first uncovered by excavation. It is then grit blasted to remove dirt and graphitized iron and also to etch the surface. This allows the first primer coat that is applied to both mechanically and chemically bond to the metal.

Specifically designed chemicals in the first primer key into the metal surface forming the mechanical and chemical bonds and at the same time provide sites for the mechanical and chemical bonding of the second primer. This in turn is similarly designed both to bond to the first primer and also to the seal material, thus providing a continuous chemically and mechanically bound system from the metal to the seal material.

The seal material itself is based on a blend of polychloroprene rubbers and the total formulation specifically designed to provide a high degree of crystallinity.

While the pipe is being grit blasted and the primers applied, the rubber is heated in an oven at 150 degrees C. At this temperature the material becomes very soft and moldable but upon cooling will return to its original strength and consistency.

The softened material which comes in a roughly triangular cross section cut to length, is applied to the prepared surface of the pipe. This is fitted to the annular space between the face of the bell and the spigot.

An interlocking mold plate made in two halves is now slipped over the pipe and moved into position. The seal is now molded under pressure over the entire primed surface of both the spigot and the face of the bell, forming an integral seal over and in the annular space between the two pipes.

To accomplish this a metal harness is dropped on to the pipe behind the mold plate with the forward collar section taking a position behind the bell which acts as an anchor or thrust point from which pressure can be exerted on the rear of the harness in contact with the mold plate. Hydraulic jacks in the harness push against the mold plate providing the pressure to form the seal. No caulking or facing is required and the seal is applied while the leak is blowing. After a thirty minute cooling period, the pressure is released and the mold plate and harness are removed, leaving the completed seal. The seal is then tested for gas leakage with soap and water. If satisfactory, it can then be immediately backfillled.

Upon cooling in its final shape a high degree of crystallinity is effected. The formation of these crystallites further enhances the mechanical sealing by proving a three dimensional network which effects a continuing constraint.

Due to the inherent tendency of polychloroprene to crosslink with age, this network increases with time.

Because of its strength, permanency, resistance to vibration and pipe movement, I feel the above described method offers a new dimension to safety of cast iron systems.

Your early consideration of this request is urged.

Your very respectfully,

Miller Pipeline Corporation

Don W. Miller
President

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